## WHAT IS CLAIMED IS:

- 1. A system of section cutting and analysis of a computer model comprising:
- a computer system, wherein said computer system includes a memory, a processor, a user input device and a display device;
  - a computer generated model of a structural member stored in the memory of the computer system;
- a user locating at least a first cutting plane and a last cutting plane on the computer model using the user input device, wherein the first and last cutting planes define a cutting path, and the computer model is cut into at least one section along the cutting path;
- said computer system maintaining the section in the memory;

said computer system using a computer aided engineering (CAE) analysis to predict a property of the section; and

- the user using the input device to modify the section, if the property does not meet a predetermined criterion.
- A system as set forth in claim 1
   wherein the computer system prompts a user to input a

shell thickness if the model is a computer-aided design (CAD) model.

- 3. A method as set forth in claim 1
  5 wherein the computer system prompts a user to input a material type if the model is a computer-aided design (CAD) model.
- 4. A method as set forth in claim 1 wherein the cutting plane is generated by the user selecting two points on the model using the input device and the computer system generates a vertical plane oriented perpendicular to a line between the points.
- 15 5. A method of section cutting and analysis of a computer model, said method comprising the steps of:

selecting a computer generated model of a structural member, wherein the computer generated 20 model is stored in a memory of a computer system;

locating at least a first cutting plane and a last cutting plane on the computer generated model, wherein the first and last cutting planes define a cutting path;

25 cutting the computer generated model into at least one section along the cutting path;

maintaining the section in a memory of the computer system;

analyzing the section using a computer aided engineering (CAE) analysis;

5 determining if the CAE analysis of the section meets a predetermined criteria;

modifying the section if the predetermined criteria is not met; and

using the section in the design of the 10 model if the predetermined criterion is met.

- 6. A method as set forth in claim 5 including the step of determining if the model is a computer aided design (CAD) model and prompting a user to input a shell thickness if the model is a CAD model.
- 7. A method as set forth in claim 5 including the step of determining if the model is a 20 computer aided design (CAD) model and prompting a user to input a material type if the model is a CAD model.
- 8. A method as set forth in claim 5 including the step of defining an area of the model

for locating the cutting path after said step of selecting a computer model.

- 9. A method as set forth in claim 5
  5 including the step of prompting a user to input a number of sections to generate, prior to said step of locating the first and last cutting planes.
- 10. A method as set forth in claim 5,

  10 wherein said step of locating a cutting plane includes the step of selecting two points on the model and generating a vertical plane oriented perpendicular to a line between the points.
- 15 11. A method as set forth in claim 5 wherein said step of locating a cutting plane includes the step of selecting a line on a computer aided design (CAD) model defining the cutting plane.
- 20 12. A method as set forth in claim 5 including the step determining if the model is a finite element analysis (FEA) model and simplifying the FEA model by replacing a shell element along the cutting path with a beam element.

- 13. A method as set forth in claim 5 wherein said step of analyzing the section includes the step of using finite element analysis to determine a geometric property of the section to 5 assess its stiffness.
- 14. A method as set forth in claim 5 wherein said step of analyzing the section includes the step of using finite element analysis to determine a crush strength of the section.
  - 15. A method of section cutting and analysis of a computer model of a structural member, said method comprising the steps of:
- selecting a model of the structural member from a library of models stored in a memory of a computer system having a memory, a processor a user input device and a display device;

defining an area of the model for section 20 cutting and analysis using the device;

locating at least a first cutting plane and a last cutting plane on the model, wherein the cutting plane is located by selecting two points on the model and generating a vertical plane oriented perpendicular to a line between the points;

defining a cutting path between the first and last cutting planes;

cutting the model into a predetermined number of sections along the cutting path;

5 maintaining the cut sections in the memory of the computer system;

analyzing the sections using a computer aided engineering (CAE) analysis to determine geometric properties and crush strength of the section;

determining if the CAE analysis of a selected section meets a predetermined criterion;

modifying the selected section if the predetermined criterion is not met; and

using the selected section in the design of the model if the predetermined criterion is met.

- 16. A method as set forth in claim 15 including the step of determining if the model is a 20 computer aided design (CAD) model and prompting a user to input a shell thickness if the model is a CAD model.
- 17. A method as set forth in claim 1525 including the step of determining if the model is a computer aided design (CAD) model and prompting a

user to input a material type if the model is a CAD model.

- 18. A method as set forth in claim 155 including the step of prompting a user to input a number of sections to cut along the cutting path.
- 19. A method as set forth in claim 15 wherein said step of locating a cutting plane 10 includes the step of selecting a line on a computer aided design model defining the cutting plane.
- 20. A method as set forth in claim 15 including the step determining if the model is a 15 finite element analysis (FEA) model and simplifying the FEA model by replacing a shell element along the cutting path with a beam element.